INTERNATIONAL COORDINATION OF SPACE EXPLORATION – SEEKING A SCIENTIFIC PERSPECTIVE

COSPAR, August 2014, Moscow, Russia

Co-Chaired by DLR – Juergen Hill, CNES – Francois Spiero

ISECG Background

Global Exploration Strategy (GES)

- Jointly released in May 2007 by 14 space agencies
- Vision for robotic and human space exploration
- Evolving process towards a global, strategic and comprehensive approach to space exploration

International Space Exploration Coordination Group (ISECG)

- Created in 2007 in response to the findings of the GES
- Voluntary, non-binding international coordination mechanism
- 14 participating space agencies exchange information regarding their interests, plans and activities in space exploration
- ISECG chairmanship is rotating on a regular basis; currently chaired by the CSA (Apr 2013 – Sep 2014)

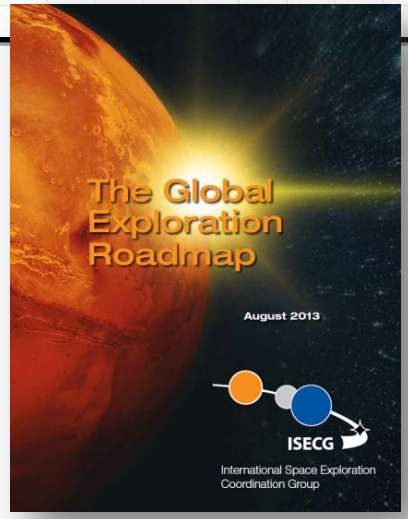
Latest ISECG Products

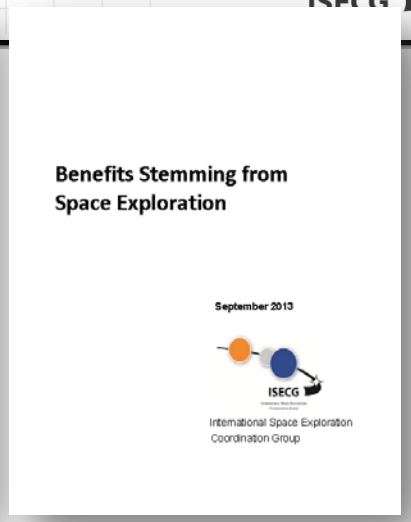
Global Exploration Roadmap

Common reference plan from iterative roadmapping process

- to enable dialogue among agencies on their goals and plans for human exploration towards Mars
- to prepare for collaborative space exploration missions
- to generate innovative ideas and solutions from broader community

- **Document first released 2011, updated in 2013**
- **Driven by common goals and strategic principles**

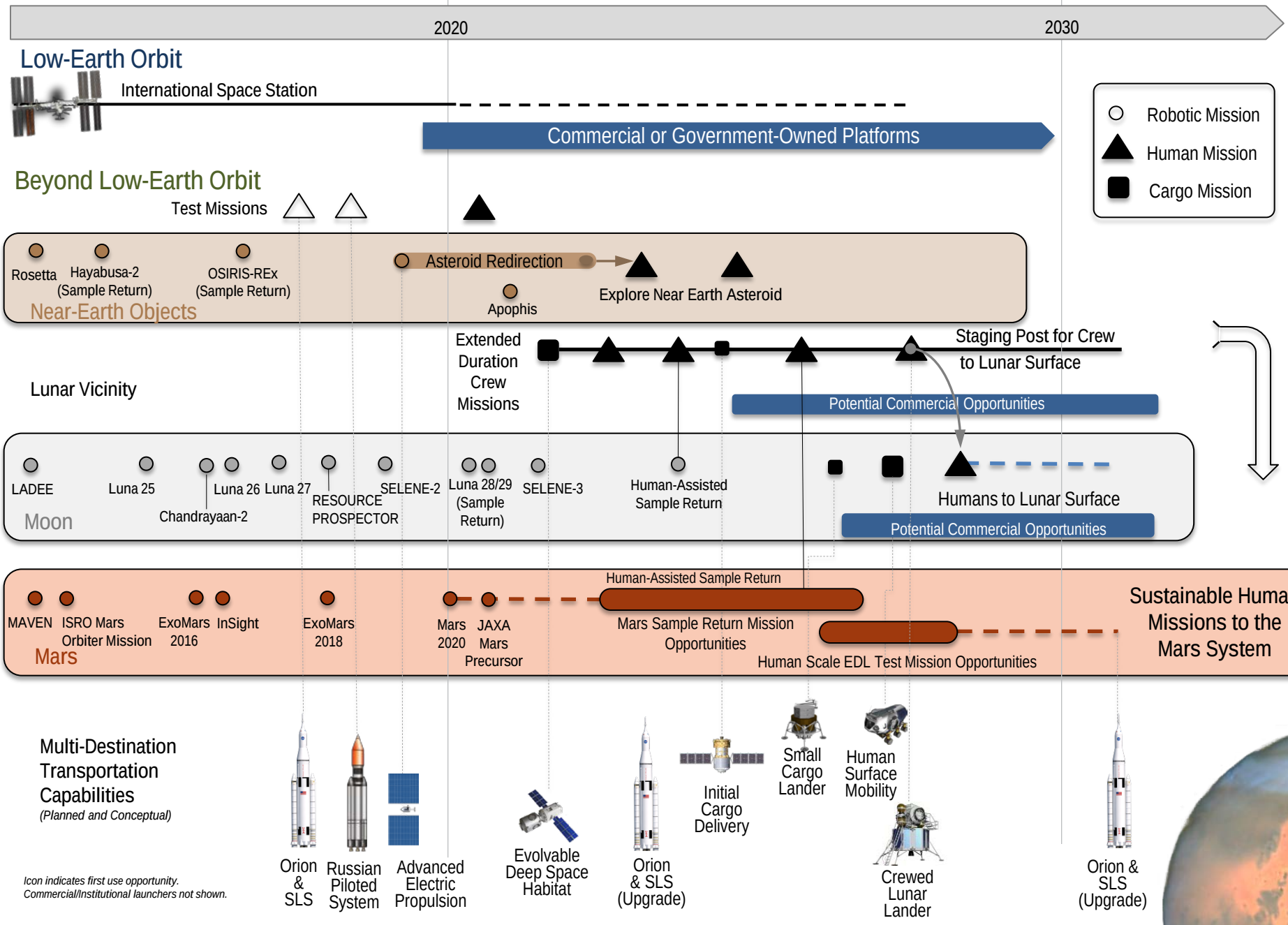




Benefits Stemming from Space Expl.

- Supports agency communication with political decision-makers
- Establish common benefits-related framework and vocabulary
- Benefits grouped in three areas:
  - Innovation
  - Culture and Inspiration
  - New Means to Address Global Challenges

ISECG GER Mission Scenario



Continue Roadmapping Activity

- **Detail long-range strategy, near-term mission scenario (2020 – 2030)**
  - Advance definition of innovative mission concepts, leveraging on humans in cis-lunar space and robotic lunar surface assets
  - Define strategies and architectures for accessing lunar surface with humans
  - Understand Mars-forward demonstration value of near-term missions
- **Solicit stakeholder feedback on 2nd GER iteration**
- **Better articulate science opportunities (SWG)**
- **Further promote coordination of preparatory activities in fields such as**
  - Human research,
  - Technology demonstration,
  - Acquisition of knowledge about exploration destinations critical for human missions

➔ **3rd GER iteration roughly in the end-2015-timeframe**

Articulate Science Opportunities

Objective

- Aims at the **facilitation of exchange between ISECG, exploration and science communities** for the benefit of all sides.
  - → Dedicated ISECG WG has been created (Science Working Group, SWG)
  - → Bring together scientists and programmatic experts
- 2014: Develop a **concrete plan for mutually beneficial interaction with the scientific communities** to promote the scientific accomplishments in present and future exploration activities as articulated in the GER. This includes the interaction with international scientific groups.

Activity Themes

- Science drivers for exploration destinations
- Science opportunities in the GER mission scenario

Initiate Development of Document on "Science Enhanced by the Human/Robotic Exploration Partnership"

Document on Science Opportunities – WHAT ?

- **Document: "Science Enhanced by the Human/Robotic Exploration Partnership"**
- **Proposal**
  - Describe an international view of the science that could be enabled by missions in the GER by engaging the scientific communities in identifying these opportunities
  - Target the same stakeholder community as the GER – stakeholders, decision makers, broader human space exploration community while engaging the scientific community
  - Could be distributed as a companion document to the GER with next update (end 2015).
  - Focus on human missions and human/robotic concepts with emphasis on early mission themes, but incorporate the driving science priorities up to Mars: Lunar vicinity, asteroids, Moon, Mars system and Mars.
  - Foster a deeper mutual understanding of priorities, challenges and opportunities for both scientific and exploration communities
- **Incorporates various scientific themes/communities, e.g.**
  - Planetary Science, Space Science, Life Sciences, Astrobiology, Astronomy, Physical Sciences, including Strategic Knowledge Gaps
  - Links to substantive authoritative literature from the international science community
  - Can provide input on the high level science topics and research priorities that could be addressed by missions in the GER.
- **Concise formulation. Purpose is to link comprehensive external documents to the GER not to define the science.**

Document on Science Opportunities – HOW ?

- **Needs significant role/ownership among the international scientific communities in development of the contents**
- **Diversity of scientific community needs to be respected. Possible approaches could be:**
  - Commissioning of inputs by each agency from their own stakeholder communities (common approach or individual?)
  - International call for ideas
  - Identify science representatives to prepare scientific material (global/regional?)
- **Inputs solicited through agencies and consolidated by ISECG or nominated panel**
- **Each agency seeks to verify/confirm the validity of the document through whatever process is required internally.**
  - The processes might need to be defined in advance in order to ensure that verification requirements are addressed during the preparatory process.

Interaction with Scientific Communities

ISECG

- **Purpose**
  - Seek feedback on the overall vision and rationale for the paper
  - Seek feedback on possible scope and content for the paper
  - Seek inputs on the development approach
  - Identify leaders in the science community willing to lead development of the paper

- **Specific Questions:**
  - Do you think a paper targeting the proposed audiences would be useful? If not, what would you change?
  - Do you agree with the objectives of the paper? If not, what would you change?
  - What level of detail would be appropriate for the audiences targeted?
  - Are there overall concerns with implying international consensus on science priorities? Who could seek consensus on these topics?
  - What are the international science priorities associated with each of these destinations? Which are priority landing sites?
  - Which science objectives benefit most from human-robotic interaction?
  - What advice can you give on developing chapters?
  - What sort of review/vetting of the paper would be important prior to release?

- **Solicit feedback and ideas to:**
  Juergen Hill (DLR): Juergen.Hill@dlr.de & Francois Spiero (CNES): francois.spiero@cnes.fr


EXPLORING
TOGETHER
INTERNATIONAL SPACE EXPLORATION
COORDINATION GROUP
ISECG
www.globalspaceexploration.org
ISECG is the international forum set up by 14 space agencies to advance the Global Exploration Strategy through coordination of their mutual efforts in space exploration